much less important. Hence the grander phases of *ocean circulation* (except in so far as they depend on winds, and therefore on *atmospheric circulation*) are much more dependent upon polar cold than upon tropical heat. On the other hand, those of atmospheric circulation depend more upon tropical heat than on polar cold. For the great temperature effects are produced mainly at the upper surface of the ocean, and at the lower surface of the atmosphere. Hence, if there were no great modifying causes, we should expect to find (on the whole) the lower water, as well as the lower air, coming from both sides towards the equator, and the upper currents of each flowing to the poles."

Chapter XXI. is entitled "Elements of Thermodynamics." The subject is nevertheless treated in a very complete manner, and is evidently regarded by our author as something in the shape of a *header*. We gather this from the very characteristic invitation to take the leap which is addressed to the student in Art. 381. We shall not, however, repeat the invitation, but rather leave the reader to find it out for himself and then—take the leap.

Let us conclude with one more quotation :—

"We have merely to think of the ideas which we try to express by such words as Time, Space, and Matter, to see that, however far discovery may be pushed, our little 'clearing' can never form more than an infinitesimal fraction of the 'boundless prairie.' No part of this, however, can strictly be called inaccessible to unaided human reason, if time and patience fail not. But far beyond in one sense, though in another sense ever intimately present with us, are the higher mysteries of the true Metaphysic, of which our senses and our reason, unaided, are alike unable to gain us any information."

While cordially indorsing these views, the writer of this notice would remark how admirably fitted is such a science as Physics for the discipline of the human mind. It possesses that boundlessness which is the *ultimate* characteristic of all true knowledge, and this is so obvious that few are bold enough to represent our "little Physical clearing" as bounded by an "impenetrable wall" or by the "abyss."

The scientific incendiary (to change the metaphor somewhat) prefers to confine himself to regions where there is a large collection of inflammable materials, until at length his attempts are brought to an end by the copious stream of cold water with which the physicist is able to deluge the scene of his exploits.

BALFOUR STEWART

OUR BOOK SHELF

Beiträge zur Kenntniss der Liasischen Brachiopodenfauna von Südtyrol und Venetien. Von Hyppolyt Haas, Dr. Phil., Privat-docent an der Universität Kiel. Mit 4 lithographirten tafeln. 4to. (Kiel: Lipsius und Tischer, 1884.)

THIS is one of the numerous works which have been published during the last half century on the fossil forms of Brachiopoda, that most ancient, abundant, and anomalous class of the Invertebrata. Dr. Davidson has devoted the greater part of a tolerably long life to the study of this exceedingly interesting group; and the volume of the Palæontographical Society's publications for the present year will complete and close his valuable labours on the fossil Brachiopoda of Great Britain. He has kindly furnished me with the following critical notice of Dr. Haas's work, the title of which is above given :—

"Dr. Haas describes in his memoir some 40 species of Liassic Brachiopoda, and of which number 12 are new. In four admirably drawn quarto plates he gives figures of 32 species. The Liassic Brachiopoda from South Tyrol and Venetia are very remarkable, and have in part been described and beautifully illustrated by Gemmellaro, Böckh, Uhlig, Meneghini, Canavari, Oppel, Zittel, and Schmid; *Waldheimia perforata*, Piette, and *Spiriferina rostrata*, Schl., being the only species out of the number that occur in the Liassic rocks of Great Britain. Dr. Haas's work adds much to our knowledge with respect to the Liassic Brachiopoda, and his descriptions have been carefully drawn up. In 1881 and 1882 Dr. H. Haas and Dr. Camille Petri published a very important work, entitled 'Die Brachiopoden der Juraformation von Elsass-Lothringen,' accompanied by 18 beautifully drawn quarto plates. In this work the authors describe some 92 species from the Lias and Inferior Oolite, and of which a large proportion occur likewise in our British rocks. It is to be hoped that Dr. Haas will continue his valuable researches among the Brachiopoda."

"Non meus hic sermo!"

J. GWYN JEFFREYS

Tricycles of the Year 1884. By H. H. Griffin. (London: L. Upcott Gill, 1884.)

WHATEVER improvement in health and strength may have resulted from the now prevalent exercise of cycling, there seems to be a mental improvement, for a knowledge of the science of mechanics is more widely spread, or at any rate there is a more general desire to understand this science in so far as its application to the bicycle and tricycle is concerned. For this reason such a book as Mr. Griffin's "Tricycles of the Year" is likely to be of value, for in it he describes in simple language most of the tricycles which can now be obtained, giving particulars of dimensions and weight, and other information which a cyclist may require.

It is a pity that many well-known machines are not so much as mentioned, among which are the "Rudge," the "Cheylesmore," and the direct-action machines. Is it that there has been no improvement in any of these since last year? If so, why should the "Oarsman" be omitted or some others be described at length?

The good qualities and advantages of each machine are set forth plainly enough, while the defects are left to be discovered by riders. The author has no doubt acted wisely here; it would be next to impossible in dealing with such a multitude of often similar machines to make comparisons which cyclists who hold opposite opinions would not consider unfair.

The action of parts that are peculiar to any machine is carefully described, figures being inserted where necessary to make the text more comprehensible. The general appearance which many tricycles present is shown by a series of woodcuts.

Bicycles are not discussed, as they form the subject of a corresponding work. C. V. B.

LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.

[The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to insure the appearance even of communications containing interesting and novel facts.]

Chalk and the "Origin and Distribution of Deep-Sea Deposits"

I LOOKED forward with great interest to the conclusion of Messrs. Murray and Renard's "Origin and Distribution of Deep-Sea Deposits," hoping that some useful comparisons would

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have been made between the present sea-beds and the Chalk, the Gault, and the Greensands, which appear to be among the deepest water deposits now accessible as dry land. Instead of this we are merely told that chalk "must be regarded as having been laid down rather along the border of a continent than in a true oceanic area" (NATURE, p. 134). All geologists are aware, since the publication of Dr. Gwyn Jeffreys' address to the British Association, and the appearance of Mr. Wallace's "Island Life," that some naturalists regard the Chalk as a shallow-water formation, but the former opinion, pronounced as it was by one of the most competent judges, was based exclusively on the present habits of the very few genera of Mollusca that have survived from the Chalk period, and seems quite in contradiction to the far more important groups, the Sponges, Echinodermata, and the minute organisms of which the formation is so largely composed, while no opinion has yet found its way into the hands of geologists regarding the depth of water indicated by the Crustacea and the fishes of the Chalk. Mr. Wallace's collation of the Chalk, as a formation, with the decomposed coral mud of Oahu, is so fantastic as to have failed to carry conviction to the mind of any competent geologist. The points of resemblance between some Globigerina ooze and the Chalk are so numerous and peculiar, that surely the assertion that the latter is a littoral formation, while the former is oceanic, requires strong support. The relative analyses of chips from the Chalk and of Globigerina ooze, quoted by Mr. Wallace, are not by any means final or conclusive. We all know that the silica has been removed and segregated into flints from the White Chalk at Shoreham, and that the iron and other metals are also segregated into crystallised masses, so that a comparison of the Chalk, minus these, is misleading. In like manner the Grey Chalk at Folkestone has lost all its oxide of iron by segregation and crystallisation, and many of the layers are cherty, and unduly rich in silica obtained probably at the expense of other layers in which it is now relatively scarce. During the ages that Chalk has been elevated and has acted as a sponge for the collection of rain water, who can say what other of its constituents may not have been dissolved away or metamorphosed? Siliceous sponge skeletons have been replaced by calcite, calcite shells have been replaced by silica, whilst aragonite shells have been entirely dissolved away. In like manner, can it possibly be contended that the absence of volcanic matter in the Chalk is an important distinction between it and Atlantic ooze? It is an accidental lithological distinction, but nothing more, and merely shows that volcanic dust was not being ejected in the same masses as at present. The Cretaceous and Eocene eruptions, so far as I am aware, are all fissure eruptions of vast magnitude, and the contemporary rocks in their vicinity seem to show that they were not accompanied by the showers of ash that mark eruptions from craters at the present day. Messrs. Renard and Murray have had exceptional opportunities of studying this question, and have no doubt convincing proofs of their statement regarding the littoral character of the Chalk deposit; but I really think that, considering the national character of the undertaking which made the collection of proof possible, it should no longer be withheld. Geologists at present, supposing my feelings are generally shared, are asked to believe that an enormous formation, which shows little, if any, trace of the proximity of land, and abounds with the remains of deep-sea life, was laid down upon a coastline; but beyond the extravagant assertion that it is decomposed coral-mud no reasons whatever for this belief are brought forward, nor are any areas pointed out in which an equivalent to the Chalk is in course of deposition. I cannot conceive why our official geologists have ignored this, one of the most important questions in the whole range of the science. It is little to our national credit that, having spent vast sums in the collection of evidence, we are still in the dark as to its geological significance.

J. STARKIE GARDNER

A Rhyolitic Rock from Lake Tanganyika

THE interesting note by Dr. H. J. Johnston-Lavis on a volcanic rock from the shores of Lake Nyassa (NATURE, p. 62) calls to my mind a couple of specimens in my collection which, with not a few others of interest, have perforce remained for some time undescribed. They were given to me by N. F. Robarts, Esq., F.G.S., who received them from Capt. Hore of the London Missionary Society, by whom they were collected at Cameron's Bay on the south-west of Lake Tanganyika, a little north of the Lofu River. As they are evidently fragments of the same kind of rock, I have only had a slide prepared from one of them. The rock is externally of a pale yellowish- to reddish-gray colour; compact, but exhibiting faint traces of a fluidal structure, with occasional spots resembling small crystals of decomposed felspar. A fresh broken surface, however, shows the real colour to be a purplish brown, streaked and mottled with a pale reddish tint. Microscopic examination shows that the rock is a rhyolite, somewhat darkened with numerous specks of disseminated ferrite, with many clearer bands, indicative of a fluidal structure. In this matrix are scattered crystals of decomposed felspar, not exceeding ·1 inch in diameter, and a few plates of a ferruginous mica, also exhibiting signs of decomposition, with two or three granules of quartz. With crossed Nicols a minute devitrification structure is exhibited by the slide as a whole, and this is coarser and stronger in the clearer bands. Here crystalline quartz is developed, which assumes with the felspars on occasion a spherulitic or sometimes approximately micrographitic structure. The larger felspar crystals are rather decomposed, but orthoclase and a plagioclastic felspar can be recognised. Many distinct granules of iron peroxide (? hæmatite) are scattered about. Examination with high powers causes me to doubt whether the devitrification is complete in all parts of the slide, and whether the phenomena are not rather due to the development of a large number of minute crystallites of not very regular form in an isotropic base. In this, however, there is nothing exceptional.

From the structure I should consider it more probable that the specimen had been taken from a flow than from a dyke. I should suspect the devitrification structure to be the result of secondary change, and the rock not a very modern one. In some respects it reminds me of the pre-Cambrian rhyolites (devitrified) of Britain, but I should think it had not quite so high a percentage of silica, *i.e.* that this did not exceed 70, and perhaps was rather less. Among the rhyolitic rocks which I described from Socotra (*Phil. Trans.* 1883, p. 273), collected by Prof. I. B. Balfour, were some of a rather dark purple colour, not unlike to this specimen from Lake Tanganyika.

T. G. BONNEY

Aseismatic Tables for Mitigating Earthquake Shocks

IN Mr. Topley's paper on the Colchester earthquake, which appeared in NATURE, vol. xxx. p. 60, he mentions the aseismatic joint designed by my father, Mr. David Stevenson, for mitigating the effects of shocks on lighthouses in countries subject to earthquakes, and from information which Mr. Topley has received and cites it would appear that the appliance had been tried in Japan, found wanting, and abandoned. The facts of the case, however, are as follows, and are supplied to me by Mr. Simpkins, who was engaged in fitting up the apparatus sent out from here, and has only recently returned from Japan. Of the seven lighthouse apparatus designed by Messrs. D. and T. Stevenson and furnished with the aseismatic joint and sent out to Japan, there are three at present in action, and have been so for ten years, viz. Mikomoto, Siwomisaki, and Yesaki. At Iwosima and Satanomisaki, in the south end of the island, the tables are screwed up so as not to act, as it is reported that no earthquakes are felt at these stations. At Tsuragisaki and Kashmosaki, which are revolving lights, the steadying screws sent out with the apparatus (to prevent the table oscillating while winding up the machine, which is the main inconvenience felt, and which was foreseen) were for some reason not put in at these stations, and the tables were firmly strutted with timber to prevent any motion. These two are the only lighthouses at which any damage has been done; while those stations at which the tables are in operation have never suffered at all, although they have been repeatedly subjected to shocks.

With regard to the effect of wind, to which Mr. Topley alludes, I may say that none of the *towers* are placed on tables, it is only the *apparatus* inside the lantern which is so treated, although my father proposed it for the towers themselves, and I have no doubt that, from the experiments I saw made here, they would have been equally effective. Two towers fitted with the tables were made and sent out to Japan, but were unfortunately lost at sea and not replaced.

CHARLES A. STEVENSON

45, Melville Street, Edinburgh, June 16

The "Cotton-Spinner"

ON seeing my article on this rare British Holothurian, Mrs. Fisher—who, as Miss Arabella B. Buckley, is well known to a

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